

ABSTRACT OF THE DISCLOSURE

Atrial arrhythmias, a major contributor to cardiovascular morbidity, are believed to be influenced by autonomic nervous system tone. The main purpose of this invention was to highlight new findings that have emerged in the study of effects of autonomic nervous system tone on atrial arrhythmias, and its interaction with class III antiarrhythmic drug effects. This invention evaluates the significance of sympathetic and parasympathetic activation by determining the effects of autonomic nervous system using a vagal and stellar ganglions stimulation, and by using autonomic nervous system neurotransmitters infusion (norepinephrine, acetylcholine). This invention evaluates the autonomic nervous system effects on the atrial effective refractory period duration and dispersion, atrial conduction velocity, atrial wavelength duration, excitable gap duration during a stable circuit (such atrial flutter circuit around an anatomical obstacle), and on the susceptibility of occurrence (initiation, maintenance and termination) of atrial re-entrant arrhythmias in canine. This invention also evaluates whether autonomic nervous system activation effects via a local neurotransmitters infusion into the right atria can alter those of class III antiarrhythmic drug, sotalol, during a sustained right atrial flutter. This invention represents an emergent need to set-up and develop a new class of anti-cholinergic drug therapy for the treatment of atrial arrhythmias and to combine this new anti-cholinergic class to antiarrhythmic drugs. Furthermore, this invention also highlights the importance of a local application of parasympathetic neurotransmitters / blockers and a catheter ablation of the area of right atrium with the highest density of parasympathetic fibers innervation. This may significantly reduce the occurrence of atrial arrhythmias and may preserve the antiarrhythmic effects of any drugs used for the treatment of atrial re-entrant arrhythmias.